

Thomas A. Edmunds, Ph.D.
edmunds2@llnl.gov 925-423-8982
Lawrence Livermore National Laboratory

EDUCATION

Ph.D. University of Texas at Austin, Operations Research
M.B.A. University of Texas at Austin
M.S. University of Virginia, Nuclear Engineering
B.S. University of Virginia, Nuclear Engineering
Coursework at Stanford University: Electrical Engineering and Computer Science

EMPLOYMENT HISTORY

2002- Associate Program Leader for Energy Systems Analysis, LLNL

- Business development and project management for energy projects
- Technology development for system performance, project selection, risk assessment and scheduling using a variety of optimization, game theory, statistical analysis and machine learning tools

2000-02 Director of Decision Sciences, SummitLogic Corp.

- Develop, implement, and market software tools for R&D portfolio management to contract manufacturers in the auto parts, electronics, and specialty chemicals industries

1989-00 Group Leader, Decision Sciences, LLNL

- Develop proposals and conduct studies related to nuclear material proliferation, energy economics and other topical areas

1993-94 Lecturer, California State University East Bay

- Teach statistics courses in School of Business and Economics

1986- Private consultant

- Expert witness for rate cases on behalf of Dow Chemical, Coastal Refining and Marketing, and Lyondell regarding plant investments and competitive markets for electric power
- Assess the economic benefits of coordinated planning and operation of electric utilities in ERCOT using mixed-integer, linear programming models
- Feasibility studies for proposed private electric power generation projects

1988-89 Lecturer, University of Texas at Austin

- Teach courses in operations research and engineering economics

1983-86 Engineer, Utility Evaluation Group, Public Utility Commission of Texas

- Expert witness at hearings regarding proposed utility investments and system operations
- Management audits of electric utilities in collaboration with Deloitte Consulting and Accenture

1979-81 Engineer, Westinghouse Electric Corp.

- Power plant design engineer

PROFESSIONAL

President – Institute for Operations Research and the Management Sciences (INFORMS) – Northern California Chapter
Edelman Prize for Excellence in Operations Research – Runner up in 2005
Member – Institute for Electrical and Electronics Engineers (IEEE)

Selected Publications
Thomas A. Edmunds, Ph.D.

- 1) Edmunds, T. A. and J. F. Bard, A Decomposition Technique for Discrete Time Optimal Control Problems with an Application to Water Resources Management, *Mathematical and Computer Modelling*, vol. 13, no. 1, pp. 61-78 (1990).
- 2) Edmunds, T. A. and J. F. Bard, Time-Axis Decomposition of Large-Scale Optimal Control Problems, *Journal of Optimization Theory and Applications*, vol. 67, no. 2, pp. 259-277 (1990).
- 3) Edmunds, Thomas A. and Jonathan F. Bard, Algorithms for Nonlinear Bilevel Mathematical Programs, *IEEE Transactions on Systems, Man, and Cybernetics*, vol. 21, no. 1, pp. 83-89 (1991).
- 4) Edmunds, Thomas A. and R. Scott Strait, Evaluating Arms Control Treaty Verification Regimes: A Risk Analysis Approach, *Probabilistic Safety Assessment and Management*, George Apostolakis ed., Elsevier, New York (1991).
- 5) Edmunds, Thomas A. and J. F. Bard, An Algorithm for the Mixed-Integer Nonlinear Bilevel Programming Problem, *Annals of Operations Research* 34, pp. 149-162 (1992).
- 6) Shimizu, Kiyotaka, Yo Ishizuka and Jonathan F. Bard, *Nondifferentiable and Two-Level Mathematical Programming*, Kluwer (1997) (contributed chapter).
- 7) Dyer, James S., Thomas Edmunds, John C. Butler, and Jianmin Jia, A Multiattribute Utility Analysis of Alternatives for the Disposition of Surplus Weapons-grade Plutonium, *Journal of Operations Research*, Vol. 46, No. 6 (1998).
- 8) Bard, Jonathan F., *Practical Bilevel Optimization – Algorithms and Applications*, Kluwer (1998) (contributed chapter).
- 9) Butler, John, Alexander Chebeskov, James Dyer, Thomas Edmunds, Vladimir Oussanov and Jianmin Jia, The Adoption of Multi-attribute Utility Theory for the Evaluation of Plutonium Disposition Options in the United States and Russia, *Interfaces* vol. 35, no. 1 (January 2005).
- 10) Yao, Yiming, Thomas Edmunds, Dimitri Papageorgiou and Rogerlio Alvarez, Tri-level Optimization in Power Network Defense, *IEEE Transactions on Systems, Man and Cybernetics-Part C: Applications and Reviews*, Vol. 37, No. 4 (July 2007).
- 11) Edwards, Ward, Ralph F. Miles, Jr., and Detlof von Winterfeldt, Eds., *Advances in Decision Analysis*, Cambridge University Press (2007) (contributed chapter).
- 12) Edmunds, Thomas and Richard Wheeler, *WMD Terrorism: Science and Policy Choices*, MIT Press (2009) (contributed chapter).
- 13) Epperly, Thomas, Thomas Edmunds, Alan Lamont, Carol Meyers, Steven Smith, Yiming Yao, and Glenn Drayton, High-Performance Computing for Electric Grid Planning and Operations, *Proceedings of the IEEE Power and Energy Society*, San Diego, July 22-25, 2012.

Reports and Working Papers

- 1) King, Joseph, Thomas Edmunds, and John Kepner, *Cogeneration Pricing: Problems and Issues*, Public Utility Commission of Texas Technical Report #2 (1985).
- 2) Moore, William, Sarut Panjavan, Thomas Edmunds, Sidney Guermouche, Younghun Kwun, and Jeffrey Phelps, *Bulk Power Transmission Study*, Public Utility Commission of Texas (1988).
- 3) Edmunds, T. A., A Gradient Projection Algorithm for Portfolio Optimization, working paper (1991).

- 4) Edmunds, Thomas A, Richard A. Saleh, and Steven L. Zevanove, *Prioritizing and Scheduling Portsmouth Gaseous Diffusion Plant Safeguards Upgrades*, UCRL-ID-109587 (1991).
- 5) Comfort, W. J., S. E. Bumpus, T. A. Edmunds, A. R. Hall, A. D. Lamont, H. K. McCue, and E. Zywiec, *Feasibility Assessment of Electromechanical Batteries for Electric Vehicles*, UCRL-ID-109422 (1992).
- 6) Edmunds, Thomas A., Alan D. Lamont, Alan D. Pasternak, William F. Rousseau, and Carl E. Walter, *Impact of the Proposed Energy Tax on Nuclear Electric Generating Technologies*, UCRL-ID-114503 (May 1993).
- 7) Chapel, Stephen W. et al., *Distributed Utility Valuation Project* - Monograph, Electric Power Research Institute, TR-102807 (July 1993).
- 8) Chang, Lychin, Thomas A. Edmunds, and Toby T. Knox, *X-705 Facility Process Simulation Model*, Martin Marietta Utility Services, Inc., POEF-TO-5 (August 1993).
- 9) Wilkinson, Cory H., Gregg P. Brumburgh, Thomas A. Edmunds, and Douglas Kay, *A New Approach for Environmental Justice Impact Assessment*, UCRL-JC-123630 (March 1996).
- 10) O'Connell, W.J., T. A. Edmunds, D. M. Gettman, R. E. Glaser, J. A. Beatty, G. P. Brumburgh, and E. D. Jones, *Probabilistic Transportation Risk Analysis Integrator (PTRAI) Users Manual*, UCRL-MA-126196 (February 1997).
- 11) Minuzzo, Kim, Thomas Edmunds, Larry Roche, Van Boyd, and Eric Powell, *The Application of System Simulation for Engineering the Technical Computing Environment of the Lawrence Livermore National Laboratories*, UCRL-ID-131878 (September 1998).
- 12) Edmunds, Thomas, Jeffrey Stewart, and Jill Watz, *Base Case and Perturbation Scenarios*, UCRL-ID-132201 (July 1999).
- 13) Yao, Yimig, Thomas Edmunds, Dimitri Papageorgiou, and Roger Alvarez, *Optimal Resource Allocation in Electrical Network Defense*, UCRL-TR-201959 (December 2003).
- 14) Edmunds, Thomas, et. al., *Simulation Analysis of Inspections of International Travelers at Los Angeles International Airport for US-VISIT*, UCRL-TR-202734 (March 2004).
- 15) Wheeler, Richard, Thomas Edmunds and Susan Howarth, *Homeland Security: New Challenges for Decision-Making Under Uncertainty*, UCRL-TR-202536 (February 2004).
- 16) Edmunds, Thomas, Richard Wheeler, James Gansemer, and Alix Robertson, *Defensive Architectures Analysis for the Food Contamination Threat*, UCRL-TR-208391 (November 2004).
- 17) Cunningham, Christopher T., Thomas A. Edmunds, John A. Futterman, Alix Gliksman, William G. Hanley, Carl F. Melius, John J. Nitao, William D. Wilson and John G. Woodworth, *Vision for Predictive Knowledge Discovery: A Core Capability for NAI and LLNL*, UCRL-TR-219038 (September 2005).
- 18) Tsap, Leonid, Thomas Edmunds, Matthew Dombroski, John Kundert and Barry Chen, *Video-Based Detection and Analysis of Chemical Threats*, UCRL-SR-219101 (February 2006).
- 19) Dombroski, Matthew, Carl Melius, Thomas Edmunds, L. Edward Banks, Thomas Bates and Richard Wheeler, *Simulating Nationwide Pandemics: Applying the Multi-scale Epidemiologic Simulation and Analysis System to Human Infectious Diseases*, UCRL-TR-407672 (October 2008).
- 20) Edmunds, Thomas, Howard Lambert, Kofi Boakye, Sheila Vaidya, Nazir Khalil, and Joe Saloio, *Inference Technologies for Detection of State Weaponization Activities*, LLNL-TR-417990 / SAND2009-7045 (September 2009).
- 21) Edmunds, Thomas, et al., *Probabilistic Renewable Generation Scenarios for Analysis of Demand Response and Storage Resources*, LLNL-TR-576313-DRAFT (September 2012).